

## REDESCRIPTION OF *MOLPEMYIA*, AND ITS REVALIDATION AS A SUBGENUS OF *AEDES* (DIPTERA: CULICIDAE)

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**ABSTRACT.** The subgenus *Molpemyia* is resurrected from synonymy with the subgenus *Finlaya* and the species *Aedes auridorsum*, *Ae. pecuniosus* and *Ae. purpureus* are assigned to it. The subgenus is fully redescribed and features given to distinguish it from the other subgenera of *Aedes*. The three included species are redescribed and pertinent stages and structures are illustrated. Tables include the chaetotaxy of the pupa and larva of *Ae. pecuniosus*.

### INTRODUCTION

The monotypic genus *Molpemyia* was described by Theobald (1910) to include his new species *Molpemyia purpurea*. Edwards (1912a) synonymized *Molpemyia* with *Ochlerotatus* Lynch Arribalzaga and included *purpureus*, but he later included a question mark with the synonymy (1912b). *Calomyia priestleyi* was described by Taylor (1914) as a new genus and species, but he later (1919) synonymized the genus with *Molpemyia* (Taylor was apparently unaware of Edwards' synonymy of *Molpemyia* with *Ochlerotatus* in 1912). Edwards (1922) described two new species, *auridorsum* and *pecuniosus*, and included them, as well as *purpureus* and *priestleyi*, in the subgenus *Finlaya* Theobald of genus *Aedes* Meigen. Subsequent authors followed this generic and subgeneric arrangement. Edwards (1932) divided the subgenus *Finlaya* into groups based on adult ornamentation and assigned the above species, along with numerous others, to Group F (Albotaeniata Group). He acknowledged that this group was probably unnatural. Taylor (1944) synonymized *pecuniosus* and *priestleyi* with *purpureus*. Knight (1948), in an attempt to create a more manageable group, subdivided Edwards' Group F into eight divisions and proposed Division IV for *pecuniosus*, *priestleyi* and *purpureus* (he mentioned Taylor's synonymy of *pecuniosus* with *purpureus*) and Division VIII for *auridorsum* and four other species. The subdivision of the entire subgenus was continued and refined by Knight and Marks (1952) in which they included *auridorsum* and *purpureus* in Group

F (Alboannulatus Group), Subgroup IV, a system followed by subsequent authors. Reinert's (1988) examination of the types of *purpureus*, *pecuniosus* and *priestleyi* resulted in the revalidation of *pecuniosus* and confirmed the synonymy of *priestleyi* with *purpureus*.

### METHODS AND PRESENTATION

The revalidation of *Molpemyia*, as a subgenus of *Aedes*, included a study of all available life stages and is based heavily on features of the larvae, female genitalia, male genitalia, adult vestiture, pupae, and larval bionomics. The most important distinguishing features of these life stages and structures are included in the discussion section of the subgeneric treatment.

In the synonymy and distribution sections, an asterisk following the abbreviations used (♀ = female, ♂ = male, G = genitalia, P = pupa, and L = larva) indicates that at least some portion of that sex or stage is illustrated. The scale used for the illustrations is in millimeters. Distribution records are indicated with countries in capital letters, states in italics, and place names with the first letter capitalized.

Chaetotaxy, nomenclature and abbreviations follow Harbach and Knight (1980, 1982) except for new terminology suggested by Reinert (1990). In the description of thoracic scales "sbos" refers to "short, broad, overlapping, silvery."

The abbreviation recommended for the subgenus *Molpemyia* is *Mol*.

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## TAXONOMIC TREATMENT

### Genus *Aedes* Meigen

#### Subgenus *Molpemyia* Theobald

**Type species.** *Molpemyia purpurea* Theobald.

*Molpemyia* Theobald 1910; of Brunetti 1914; Taylor 1919.

*Ochlerotatus* in part of Edwards 1912a.

*Ochlerotatus* (?) of Edwards 1912b; Senior-White 1923.

*Calomyia* Taylor 1914.

*Aedes* (*Finlaya*) in part of Edwards 1922, 1924, 1932; Cooling 1924; Taylor 1944; King and Hoogstraal 1946; Knight 1948; Knight and Marks 1952; Marks 1955; Stone et al. 1959; Knight and Stone 1977; Lee et al. 1982; Reinert 1988; Evenhuis and Gon 1989.

A summary of the chaetotaxy and other features of the species included in the subgenus is as follows.

**Females.** Moderately large mosquitoes. **Head:** Antenna 0.89–0.96 length of proboscis, pedicel with few short fine setae mesally; maxillary palpus 0.2–0.3 length of proboscis, dark-scaled; clypeus bare; proboscis 1.05–1.15 length of femur I, dark-scaled; vertex and occiput covered with narrow curved scales and numerous very long erect forked scales; ocular line with narrow curved white scales; interocular and ocular setae well developed; eyes contiguous. **Thorax:** Scutum with narrow curved scales (2 species also with areas of sbos scales); setae: 2–6 median anterior promontory, acrostichal, dorsocentral, scutal fossal (2–7 anterior, 2–6 lateral, 0–4 median, 1–4 posterior), few antealar, several supraalar and prescutellar, and 1,2 parascutellar; scutellum with broad or narrow scales on each lobe; mesopostnotum bare; anteprenotum with broad or narrow pale scales, several setae; postpronotum covered with broad or narrow pale scales, 4–11 posterior setae; postspiracular area usually without scales, 2–10 setae; paratergite with patch of broad pale scales; subspiracular area bare or with broad scales; proepisternum with upper patch of broad pale

scales, 5–12 setae, lower area bare; mesokatepisternum with large upper and small lower patch of broad pale scales, 3–5 upper and 9–16 lower posterior setae; prealar area with patch of broad pale scales on lower area and extending onto upper area, prealar knob with 9–18 setae; mesepimeron with large patch of broad pale scales covering most of area, 8–20 upper setae, lower setae absent. **Legs:** Coxae I–III with large patch of broad pale scales; femora I–III dark-scaled with pale-scaled areas, II, III also with small dorsoapical patch of snowy white scales, III also with broad band of white scales on basal area; tibiae I–III dark-scaled; tarsi dark-scaled, I–III also with tarsomeres 1,2 and III with tarsomere 3 with basal broad white-scaled band (some tarsomeres may also have very narrow ring of dark scales basad of broad white-scaled bands); posttarsi I–III with 2 ungues, I, II with ungues equal in size, both with one tooth, III with ungues equal in size, both simple. **Wing:** Dorsal and ventral veins dark-scaled or with pale scales on base of costa and remigium; alula with row of narrow dark scales on posterior margin; 1–3 remigial setae; upper calypter with row of long pale setae on margin. **Halter:** Pedicel pale brown, capitellum white-scaled. **Abdomen:** Terga dark-scaled, I with large median patch of pale scales and setae, II–VII with large basolateral patch of silvery or white scales and basodorsal pale-scaled bands or patches; sterna pale-scaled with dark scales on caudal margin covering a triangular median area and increasing in size on each succeeding sternum; terga and sterna with numerous short setae on lateral and caudal margins. **Genitalia:** Tergum VIII with base gently concave, basolateral corners rounded, apex rounded, numerous broad scales, several short to moderately long setae on apical 0.38–0.58, many of these stout, apical margin also with several long stout setae, basolateral seta present, VIII-Te index 0.62–0.76; sternum VIII with base straight to slightly concave mesally, apex straight, scales present or absent, numerous short setae on apical 0.90–0.94 except for basolateral areas, a number of short curved lanceolate setae on apical area, setae 1–3-S not distinguished, however, several long setae spaced along submedian area on both sides of

midline, a subapical line of 4 moderately long to long setae extending in gradually sloping line basomesally from apicolateral corner, setae increase slightly in length mesally, basolateral seta absent, VIII-S index 0.59–0.73; tergum IX with moderately deep U-shaped median indentation in apex, 5–8 moderately long setae apically on each side of midline, 11–14 total setae, base straight or slightly concave, lateral margins slightly expanded, IX-Te index 0.60–0.89, dorsal spheres present; insula moderately to heavily pigmented with heavier pigmented area occupied by setae, lip-like, large, 6–9 short setae in a patch on each side of midline, 13–18 total setae; lower vaginal lip moderately wide, lower vaginal sclerite absent; upper vaginal lip with caudal margin broadly rounded, upper vaginal sclerite heavily pigmented, large; spermathecal eminence membranous, non-pigmented, somewhat mushroom-shaped caudally with basal area covered with densely packed short thin simple spermathecal eminence spicules directed mesally; postgenital lobe covered with moderately long curved spicules, those along base and lateral margins stouter, length moderately long with apical portion narrower, apex sharply rounded, flat or with minute median indentation, basal area wide with swollen appearance, 33–45 total setae, ventral PGL/cercus index 0.61–0.71, dorsal PGL index 1.09–1.71, ventral PGL index 1.95–2.57; cercus moderately long, moderately wide apically, broad basally, inner margin nearly straight except slightly bowed basally, apex bluntly rounded, dorsal surface without scales, 9,10 moderately long to long stout setae on apical margin and apical area, numerous short and moderately stout setae on apical 0.69–0.76, several short curved lanceolate setae along apex and distal portions of lateral and mesal margins, ventral surface with several short setae on apical and apicolateral areas, cercus index 2.15–2.98, cercus/dorsal PGL index 2.10–2.73; one large and 2 medium-sized spermathecal capsules, heavily pigmented, spherical, patch of numerous small spermathecal capsule pores near orifice, accessory gland duct base lightly to moderately pigmented.

**Males.** Generally similar to females except

for sexual features. *Head:* Antenna 0.68–0.70 length of proboscis, strongly plumose with setae directed primarily dorsally and ventrally; maxillary palpus 0.92–1.00 length of proboscis, palpomeres 2–4 straight, palpomere 3 with apical portion slightly swollen and with few to several long setae ventrally, palpomere 4 with numerous long setae ventrally, palpomere 5 slightly bent downward and with several moderately long to long setae ventrally and few long and short setae apically; proboscis 1.22–1.33 length of femur I. *Legs:* Posttarsi I–III each with 2 unguis, I,II with large unguis with 2 teeth and small unguis with one tooth, III with unguis equal in size, simple. *Genitalia:* Tergum IX with mesal membranous area separating pair of very small to small caudally or caudomesally projecting lobes each bearing 4–7 moderately long, somewhat flattened, stout, heavily pigmented setae, lateral portions of tergum broad; gonocoxite long, narrow, tergal surface with basomesal compact patch of 1,2 long and several moderately long dark stout setae, moderately long setae scattered over most of surface, few long ones on apical area, numerous broad scales on much of surface, lateral surface with numerous long and few moderately long setae, numerous broad scales, ventral surface with few moderately long setae on basomesal margin, numerous long, stout setae on apicolesal and apical areas, numerous broad scales on most of surface; gonostylus moderately long, narrow throughout length or with slight swelling subapically on mesal surface, with several short spicules, 1,2 short subapical setae, Gs/Gc index 0.38–0.41, gonostylar claw attached apically, short, nearly uniformly narrow throughout length, slightly curved, apex blunt, GC/Gs index 0.11–0.17; basal mesal lobe attached basomesally to sternomesal surface of gonocoxite, consisting of very long, narrow, curved, caudally projected stem bearing short setae, 2–4 on distal 0.3, 0–3 on middle 0.3, and 3–8 on proximal 0.3, with short spicules, and apical filament long, foliform, with proximal portion broad and tapering to long narrow distal portion, base of stem connected with its mate by narrow spiculate strip, BML/Gc index 0.37–0.43; proctiger with paraproct moderately long,

moderately broad, heavily pigmented, apex with short, curved, beak-like point bearing 2–4 small teeth, base without sternal projection, cercus membranous, with moderately pigmented, elongate, cercal sclerite bearing 3–7 short setae; tergum X consisting of moderately broad, curved, elongate plate; phallosome with aedeagus simple, trough-like, moderately long, moderately wide to wide, basal 0.45–0.55 with uniform width then lateral areas slightly expanded and rounded, this area followed by bluntly rounded apex, split mesally, teeth absent, paramere narrow with short, narrow projection near middle of length, Par/Ae index 0.68–0.76, basal piece moderately long, broad, BP/Ae index 0.41–0.53; sternum IX moderately large, with 9–14 short and moderately long setae on caudomesal area.

**Pupae.** *Cephalothorax*: Setae 1–3-CT moderately long, 2-CT slightly shorter than 1,3-CT; 4,5-CT moderately long, approximately equal in length, 4-CT single; 6-CT short; 10,12-CT moderately long, approximately equal in length; 11-CT longer than 10,12-CT, single or 2-forked. *Trumpet*: Moderately long, widest on apical 0.3; darkly pigmented; pinna moderately long. *Abdomen*: Seta 1-II-VII short, thin; 2-II-V mesad and slightly cephalad of 1-II-V, 2-VI,VII laterad of 1-VI,VII; 6-III-VIII short; 6-VII mesad and caudad of 9-VII; 9-III-V apparently ventral, 9-VII,VIII dorsal, near caudolateral margin, single, long, stout, dark, spinulate; male genital pouch large. *Paddle*: Broad, ovoid; midrib wide, weakly developed; seta 1-Pa single, off-set laterally from apex of midrib.

**Larvae.** *Head*: Seta 1-C single, moderately stout, lightly aciculate apically; 5–7-C single; 5,6-C long, stout; 7-C moderately long, laterad and slightly caudad of 6-C; 4-C moderately long, mesad and very slightly caudad of 6-C; 5-C in a line caudad of 6-C, distances approximately equal between 5-C and 6-C, and 6-C and 7-C; 13-C single, long; dorsomentum dark, with 19–21 stout teeth; mouth-brushes pectinate. *Antenna*: Short; 1-A single; 2–5-A at apex; 4-A approximately equal in length to 2-A. *Thorax*: Setae 5–7-P, 5–12-M, 7,9,10-T stout, dark, strongly aciculate; 9,10-T single. *Abdomen*: Seta 6-I-VI single, long,

stout, dark, aciculate; 7-I,II long, stout, dark, approximately equal in length to and attached to common dark setal support plate with 6-I,II; 1-II-V, 13-III-V long, stout, dark, single, attached to dark setal support plate (in *Ae. pecuniosus*); 1-VIII short; 1,2-VIII displaced somewhat laterad; 5-VIII long, stout, dark, aciculate; segment VIII with comb of 5–12 scales in a row, each short, broad, apically rounded with short stout spicules; segment X with saddle large and covering most of segment, incomplete ventrally, wide, caudal margin angulate with short spicules on dorsal area, acus absent; 1-X short, with 2–7 branches, borne at about middle near caudal margin; 2,3-X single, long, stout, dark; 4-X composed of 17–22 usually 2-forked (rarely single or 3-forked), stout, dark, plumose setae borne in a slightly irregular row along the ventral and caudal margins of exceptionally large dark rudder-like boss which projects caudally from segment X, grid absent; 4 anal papillae, short, broad, bluntly pointed. *Siphon*: Short, broad at base; acus well developed; index 1.08–1.60; saddle/siphon index 1.08–1.27; pecten on basal 0.23–0.50, composed of 8–22 evenly spaced spines, distal ones long, slender and with 2–4 small spicules on ventral margin of basal area, proximal spines reduced in size; 1-S with 2–4 branches, moderately long, stout, aciculate, borne distad of pecten, 2,6,9-S single, 6-S moderately long, 8-S short, with 3–6 branches.

**Eggs.** Unknown.

**Discussion.** The following principal features are most distinctive for *Molpemyia* and they can be used in separating it from the other subgenera of *Aedes*: adults by the combination of (1) vertex and occiput covered with narrow, curved, pale, decumbent scales and numerous very long, erect forked scales; (2) acrostichal and dorsocentral (both with anterior and posterior) setae present; (3) tibiae I-III dark-scaled, tarsi I-III with tarsomeres 1,2 and III with tarsomere 3 with a basal broad white-scaled band; (4) palpus and proboscis dark-scaled; (5) proepisternum with 5–12 (usually 7–11) upper setae; (6) paratergite with a patch of broad pale scales; (7) abdominal terga II-VII with a large median basal pale-scaled patch or band; and (8) male post-

tarsi I,II with large unguis with 2 teeth and small unguis with one tooth, III with 2 unguis, equal and simple; female genitalia by the combination of (1) sternum VIII large, apex straight with a subapical line of 4 moderately long to long setae extending in a gradually sloping line basomesally from apicolateral corner, length 0.53–0.57 mm, width 0.73–0.93 mm; (2) tergum IX with a moderately deep U-shaped median indentation in apex, 5–8 moderately long setae apically on each side of midline; (3) insula large, lip-like, 6–9 short setae in a patch on each side of midline, 13–18 total setae; (4) upper vaginal lip with caudal margin broadly rounded, upper vaginal sclerite heavily pigmented and large; and (5) postgenital lobe with long, stout, curved spicules along basal and lateral margins, basal area wide with a swollen appearance and apical portion narrower, 33–45 total setae; male genitalia by the combination of (1) tergum IX with a mesal membranous area separating a pair of very small to small caudally or caudomesally projected lobes each bearing 4–7 moderately long, somewhat flattened, stout, heavily pigmented setae; (2) gonocoxite long and narrow, tergal surface with a basomesal compact patch of 1,2 long and several moderately long, dark, stout setae, ventral surface with numerous long, stout setae on apicomeral and apical areas; (3) basal mesal lobe consists of a very long, narrow, curved stem bearing short setae, 2–4 on distal 0.3, 0–3 on middle 0.3, and 3–8 on proximal 0.3, apical filament long, foliform, with proximal portion broad and tapering to a long narrow distal portion, BML/Gc index 0.37–0.43; (4) proctiger with paraproct moderately long, apex with a short, curved, beak-like point bearing 2–4 small teeth, 3–7 short cercal setae; and (5) phallosome with aedeagus simple, trough-like, basal 0.45–0.55 with uniform width then lateral areas slightly expanded and rounded, this area followed by a bluntly rounded apex, which is split mesally, teeth absent; pupa by the combination of (1) 1–3-CT moderately long, 2-CT slightly shorter than 1,3-CT; (2) 4-CT single, approximately equal in length to 5-CT; (3) 2-II-V mesad and slightly cephalad of 1-II-V, 2-VI,VII laterad of 1-VI,VII; (4) 6-VII mesad and caudad of

9-VII; (5) 9-VII,VIII dorsal, near caudolateral margin, long stout, spinulate, single; (6) 9-III-V apparently ventral; (7) paddle with midrib broad, weakly developed, 1-Pa offset laterally from apex of midrib; and larvae by the combination of (1) 5–7-C single, 5,6-C long and stout, 7-C moderately long, laterad and slightly caudad of 6-C, 4-C moderately long, mesad and very slightly caudad of 6-C, 5-C in a line caudad of 6-C, distances approximately equal between 5-C and 6-C, and 6-C and 7-C, 13-C single; (2) antenna short, 1-A single, 2,4-A approximately equal in length; (3) 9,10-T single, stout, strongly aciculate; (4) 6-I-VI single, long, stout, 7-I,II stout, approximately equal in length to and attached to a common setal support plate with 6-I,II; (5) segment VIII with comb of 5–12 short, broad scales in a row; (6) segment X with saddle large, incomplete ventrally, caudal margin angulate, 1-X short, with 2–7 branches, 2,3-X single, long, stout, 4-X composed of 17–22 usually 2-forked, stout, plumose setae borne in an irregular row along the ventral and caudal margins of an exceptionally large, rudder-like boss, which projects caudally from segment X; and (7) siphon short, broad at base, index 1.08–1.60, saddle/siphon index 1.08–1.27, pecten composed of 8–22 evenly spaced slender spines.

Adults of *Molpemyia*, on initial examination, appear to differ (i.e., *Ae. auridorsum* with scutum covered with narrow curved scales, those cephalad of prescutal suture golden, and postpronotum and scutellum covered with narrow curved white scales, while both *Ae. purpureus* and *Ae. pecuniosus* possess scutum with narrow curved reddish-brown scales but with patches of short broad overlapping silvery scales, especially on scutal fossal, supraalar and prescutellar areas, and similar scales on scutellum and covering postpronotum, and *Ae. pecuniosus* with a stripe of broad silvery scales on acrostichal area); however, on closer examination numerous important features of the vestiture are shared by all included species (see above).

Female and male genitalia are similar for the included species, but each species possesses features distinguishing it from the others. The above principal characters separate

the female and male genitalia from other subgenera.

Larvae of *Molpemyia* are very distinctive and are easily distinguished from those of *Finlaya* and the other subgenera of *Aedes* by the features noted above. The caudally projected, exceptionally large, dark, rudder-like boss with 17–22 usually 2-forked, stout, strongly plumose setae borne in an irregular row along its ventral and caudal margins may be unique for the family Culicidae with the exception of the subgenus *Mucidus* Theobald (Group A, *Mucidus*, see illustrations in Tyson 1970) and *Uranotaenia* (*Pseudoficalbia*) *shillitonis* Edwards (see illustration in Hopkins 1952). In this group of *Mucidus* a somewhat similar but smaller and lighter pigmented boss occurs; however, it bears multiple branched, simple, fan-like setae. This group is also similarly developed to *Molpemyia* in the dark dorsomentum with stout teeth and segment X with the saddle large and caudal margin angulate, short anal papillae and setae 2,3-X long, stout, single, however, other features of the larvae and other stages are very different. The large boss of *Ur. shillitonis* bears 10 long, thin, sparsely plumose setae each of which is single to 3-branched. The predaceous larvae of many *Eretmapodites* Theobald (see illustrations in Hopkins 1952) have stout, single or 2-branched, plumose setae in 4-X, but these are longer, fewer in number and are attached to a smaller and not caudally produced boss. The development of stout, aciculate setae attached to pigmented setal support plates is noted in some other mosquitoes (e.g., *Eretmapodites*, *Toxorhynchites* Theobald, *Armigeres pectinatus* Edwards) in which the larvae inhabit water in tree holes or other plant containers. The development of the large boss on segment X, the dark stout toothed dorsomentum, and the stout setae may be attributed to convergent evolution of predaceous and or plant container inhabiting species and is not considered an indication of close phylogenetic relationship. See discussion section under *Ae. auridorsum* for additional distinctions of the species in the subgenus.

**Distribution.** Species have been recorded only from Australia in the states of Queens-

land, Northern Territory and Western Australia.

**Bionomics.** Immatures have been collected from cavities in trees, tree holes and rot-holes in trees, which may contain foul water. Larvae of all three included species are reported to be predaceous on mosquito larvae.

Females have been taken biting humans, and in the case of *Ae. pecuniosus* are avid feeders producing a fair-sized wheal accompanied by intense itching.

Relationship to disease pathogens is summarized by Lee et al. (1982) as follows: two attempts at virus recovery from three *Ae. purpureus* collected in north Queensland gave negative results and for *Ae. auridorsum* none is known.

## KEY TO ADULTS

1. Scutum with narrow curved golden scales on scutal fossal area, and scutellum with narrow curved white scales on all lobes . . . . . *auridorsum*
- Scutum with a large patch of broad silvery scales on scutal fossal area and on all lobes of scutellum . . . . . 2
2. Scutum with acrostichal area with narrow curved scales, and subspiracular area bare . . . . . *purpureus*
- Scutum with acrostichal area with a stripe of broad overlapping silvery scales extending entire length, and subspiracular area with patch of silvery scales . . . . . *pecuniosus*

### *Aedes (Molpemyia) auridorsum* Edwards (Figs. 1,2)

*Aedes (Finlaya) auridorsum* Edwards 1922:93 (♀,♂); of Edwards 1924:381, 1932:153; Lee 1944:64 (L\*); King and Hoogstraal 1946:136; Marks 1948:21 (♀,♂\*,P\*,L\*); Knight 1948:3; Knight and Marks 1952:535, 561; Stone, Knight and Starcke 1959:160; Knight and Stone 1977:92; Lee et al. 1982:77, 121; Evenhuis and Gon 1989:196; Ward 1992:185.

**Female.** *Head:* Antenna 0.89–0.92 length of proboscis; maxillary palpus 0.20–0.21 length of proboscis, dark brown-scaled; proboscis 1.13–1.15 length of femur I, scales dark brown; vertex and occiput with decumbent scales white with golden hue and erect forked scales golden, interocular and ocular setae

golden except for brown lateral ones, postgena covered with white scales, some posterior ones with golden hue in some specimens. *Thorax*: Scutum entirely covered with narrow curved scales except bare median portion of prescutellar area, golden scales covering area cephalad of prescutal suture, similar scales extending from this area as posterior acrostichal line to prescutellar area where it branches to form a narrow line along lateral margins of prescutellar space (mesad of prescutellar setae), similar narrow line laterad of prescutellar setae and extending from prescutal suture to scutellum (anterior portion of line may be indistinct in some specimens), broad lateral patch extending from scutal angle over antear and supraalar areas, reddish brown scales on areas between acrostichal and posterior dorsocentral golden lines and in some specimens extend short distance into large cephalic golden patch, similar reddish brown scales between posterior dorsocentral setae and antear-supraalar golden patch and between golden stripes located mesad and laterad of prescutellar setae; setae: 4–6 median anterior promontory, acrostichal (few anterior, several posterior), several dorsocentral (anterior and posterior), scutal fossal (4–6 anterior, 2, 3 lateral, 1, 2 median, 2–4 posterior), and 1,2 parascutellar; scutellum with patch of narrow curved white scales on each lobe; antepnotum with narrow to moderately broad curved white scales, 14–26 setae; postpnotum nearly covered with narrow curved white scales, 5–11 (usually 6, 7) posterior setae; postspiracular area usually without scales (4,5 broad white scales in 2 specimens), 4–8 (usually 5) setae; subspiracular area bare; proepisternum with patch of broad white scales, 6–12 (usually 7, 8) setae; mesokatepisternum with broad white scales forming large upper patch, narrowly connected with small lower posterior patch and broadly connected dorsally with large lower prealar patch, 3–5 (usually 3) upper and 11–13 lower posterior setae; prealar area with white scales, 11–18 setae; mesepimeron with large patch of broad white scales, 12–20 (usually 12–14) upper setae; metameron bare. *Legs*: Femora I–III with scales dark brown with violet hue, I also with anterior surface with creamy white scales at

base and for short distance on basodorsal and basoventral areas, posterior surface creamy white-scaled on basal approximately 0.6–0.7 and then narrowing to a median stripe to near apex, II also with anterior surface with basal band of creamy white scales, similar scales on basoventral approximately 0.6 and basodorsal approximately 0.3, posterior surface with basal approximately 0.5–0.6 creamy white-scaled, III also with anterior and posterior surfaces with basal approximately 0.52 white-scaled. *Wing*: With an elongate patch of creamy white scales on anterior and ventral margins of costa basad of humeral crossvein, few similar scales on basal posterior area of costa, remigium creamy white-scaled with few brown scales at about middle (brown-scaled with few creamy white scales in a few specimens). *Abdomen*: Terga II–VII with large basolateral patch of white scales, I with median area covered with golden scales and numerous long golden setae, especially on basolateral area, II–V with scales dark brown with violet hue and with a narrow to moderately wide basal band of golden scales expanding caudally on mesal area, mesal golden area extensive on V, bands connected to basolateral white-scaled patches (may be incomplete on III, IV in some specimens), VI, VIII golden-scaled except for small apicolateral patches of dark scales on VI, VII; sterna II–VII golden-scaled basally, apical areas of III–VII with scales dark brown with violet hue. *Genitalia* (Fig. 1): Tergum VIII moderately pigmented, with scales on apical 0.59–0.61, setae on apical 0.46–0.55, VIII-Te index 0.62–0.63, VIII-Te/IX-Te index 1.54–1.73, length 0.40–0.41 mm, width 0.64–0.65 mm; sternum VIII moderately pigmented, scales absent, setae on apical 0.90–0.94, VIII-S index 0.59–0.63, length 0.57–0.59 mm, width 0.92–0.96 mm; tergum IX moderately pigmented, 5–7 setae apically on each side of midline, 11–13 total setae, IX-Te index 0.73–0.84, length 0.24–0.26 mm, width 0.31–0.32 mm; insula moderately pigmented, 7–9 setae on each side of midline, 15–18 total setae; lower vaginal lip moderately pigmented; postgenital lobe with apex flat or with minute median indentation (0.03 of dorsal length), basal mesal apodeme absent, 15–20 setae on each side of midline,



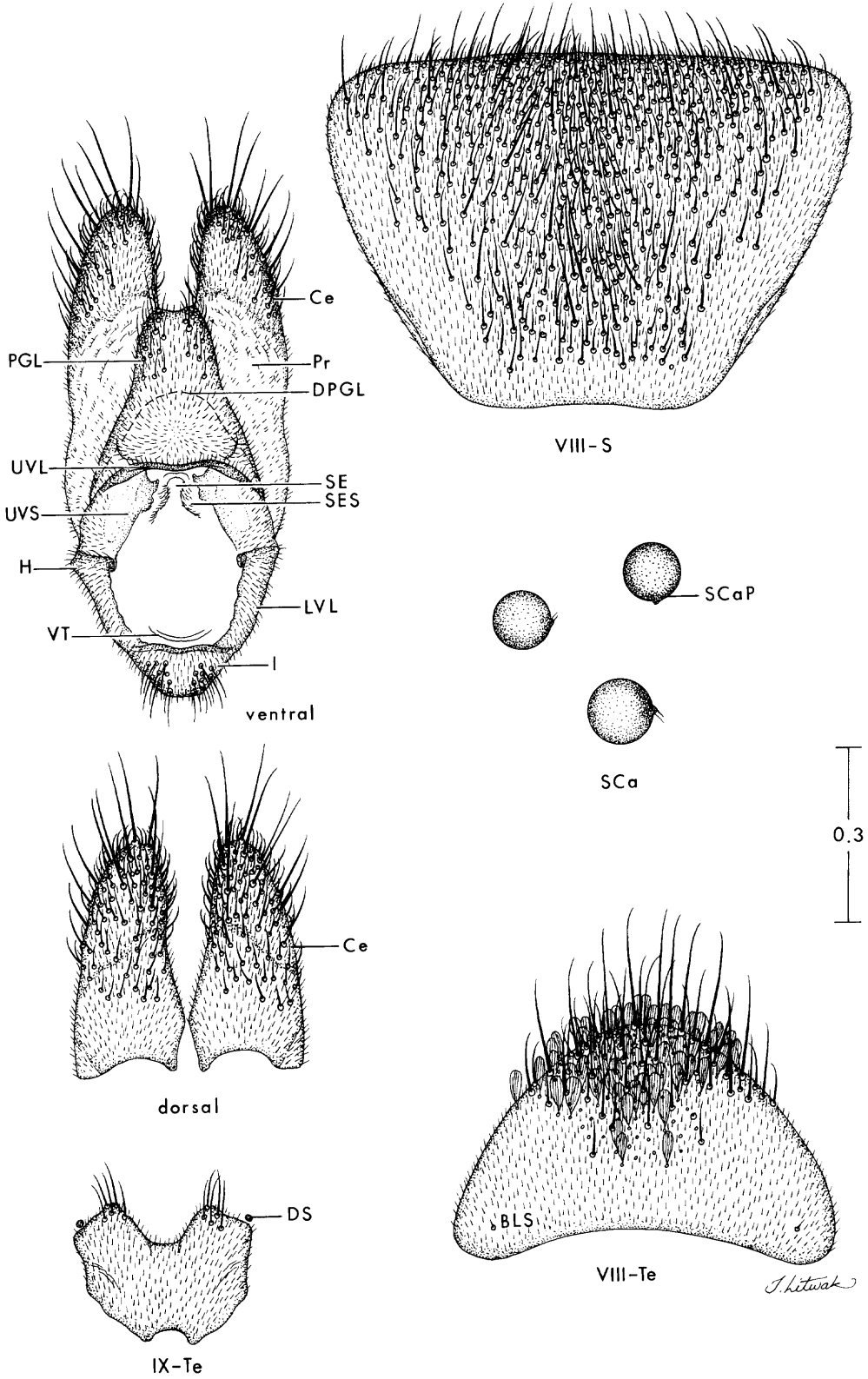


Fig. 1. *Aedes (Mol.) auridorsum*, female genitalia.

33–38 total setae, ventral PGL/cercus index 0.67–0.71, dorsal PGL index 1.09–1.12, ventral PGL index 2.02–2.03, ventral length 0.27 mm; cercus with setae on apical 0.71 of dorsal surface, cercus index 2.15–2.60, cercus/dorsal PGL index 2.44–2.73, length 0.38–0.40 mm, width 0.15–0.18 mm.

**Male.** *Head:* Antenna 0.68–0.70 length of proboscis; maxillary palpus 0.94–1.00 length of proboscis, palpomeres with following approximate proportion of total length, 5 = 0.15, 4 = 0.18, 3 = 0.33, 2 = 0.28, 1 = 0.06, palpomere 3 with apical portion slightly upturned and with long anteroventrally projecting setae, palpomere 4 with numerous long setae ventrally and few moderately long ones apically; proboscis 1.29–1.33 length of femur I. *Thorax:* Scutum golden-scaled with reddish brown-scaled areas absent or at most represented by faint spots on posterior dorsocentral areas; proepisternum with 11–18 setae on upper area; mesepimeron with 6–10 setae on upper area. *Genitalia* (Fig. 2): Tergum IX with pair of very small caudomesally projected lobes each bearing 4 setae; gonocoxite with Gc length 0.63–0.66 mm; gonostylus narrow throughout length, 2 short subapical

setae, Gs length 0.24–0.27 mm, Gs/Gc index 0.38–0.41, GC length 0.03–0.04 mm, GC/Gs index 0.11–0.16; basal mesal lobe with stem bearing setae, 2,3 on distal 0.3, 2,3 on middle 0.3, and 3–5 on proximal 0.3, proximal approximately 0.75 with short spicules, BML/Gc index 0.41–0.43, BML length 0.26–0.28 mm; paraproct with apical beak-like point with 4 teeth, 3,4 cercal setae; aedeagus moderately long, moderately wide, basal 0.55 with uniform width then lateral areas slightly expanded and rounded, this area followed by bluntly rounded apex, split mesally, Ae length 0.22 mm, paramere length 0.16–0.17 mm, Par/Ae index 0.71–0.76, basal piece length 0.09–0.11 mm, BP/Ae index 0.41–0.48; sternum IX with 9–14 setae.

**Pupa.** *Cephalothorax:* Setae 1–4,6,8–11-CT single; 5,7,12-CT with 2 branches. *Abdomen:* Seta 0-II-VIII single; 1-I multiple branched, aciculate; 1-II,IV with 2–6 branches; 1-III with 2–7 branches; 1-V with 2–4 branches; 1-VI single to 3-branched; 1-VII single to 4-branched; 2-I single to 3-branched; 2-II-VII single; 3-I-III,VII single; 3-IV single to 3-branched; 3-V-VI single or 2-branched; 4-I with 2–6 branches; 4-II with 3–

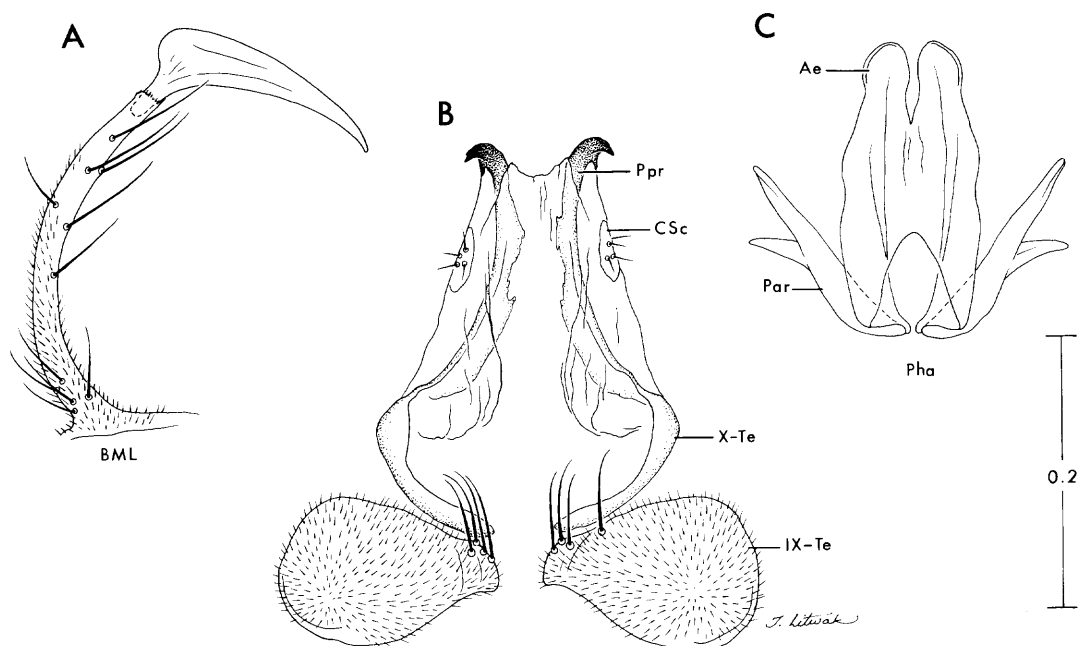


Fig. 2. *Aedes* (Mol.) *auridorsum*. Male genitalia; A, basal mesal lobe; B, terga IX,X and proctiger; C, phallosome.

8 branches; 4-III,V with 2–4 branches; 4-IV single to 3-branched; 4-VI,VII single to 4-branched; 5-I with 2–4 branches; 5-II-VII single; 6-I,VI single; 6-II,V single or 2-branched; 6-III,IV,VII single to 3-branched; 7-I single or 2-branched; 9-I,VII,VIII single. *Paddle*: Seta 1-Pa single.

**Larva.** *Head*: Seta 1-C single, slightly curved; 5–7-C single, simple, 5,6-C long, 7-C moderately long; 4,8-C single or 2-branched, simple, 4-C short; 9-C with 4–7 branches, simple; dorsomentum with 19,20 teeth. *Antenna*: With few scattered spicules; 0.25–0.30 length of head; seta 1-A single, about 0.5 length of antennal shaft, attached 0.4–0.5 from base. *Thorax*: Setae 9,10-T single, long, stout, aciculate. *Abdomen*: Setae 6-I-VI, 7-I,II moderately long, aciculate; 6-I-VI single; 7-I with 2,3 branches; 7-II single to 3-branched; 1-VIII with 2–6 branches, short; 2,4-VIII single, moderately long; 3-VIII with 3–6 branches stout, coarsely aciculate; segment VIII with comb of 8–12 scales; saddle covers about 0.9 of segment X; 1-X with 2–5 branches, about 0.14 length of saddle, simple; 2,3-X single, 2.5 length of saddle, stout, simple; 4-X composed of 18–22 setae, all except basal 3,4 borne on rudder-like boss; 4 anal papillae, dorsal pair about 0.5 length of saddle, ventral pair about 0.75 length of saddle. *Siphon*: Index 1.5–1.6; pecten on about basal 0.5, composed of 19–22 (12 in one specimen) spines; 1-S with 2,3 branches; 2,6-S single; 8-S with 3 branches.

**Discussion.** Adults of *Ae. auridorsum* are easily distinguished from both *Ae. pecuniosus* and *Ae. purpureus* by: scutum covered with narrow curved scales, area cephalad of prescutal suture golden-scaled; scutellum with a patch of narrow curved white scales on each lobe; vertex and occiput with scales white with a golden hue and erect forked scales golden; and tergum I without a lateral patch of scales, however, this area covered with long setae. The absence of a patch of pale scales on the lateral area of tergum I was also noted in *Ae. subauridorsum* Marks, *Ae. atropalpus* (Coquillett) and *Ae. epactius* Dyar and Knab, and is unusual for the genus *Aedes*. Adults of *Ae. pecuniosus* and *Ae. purpureus* have: scutum

with patches of broad silvery scales with a background of narrow curved reddish brown ones; scutellum with a patch of broad silvery scales on each lobe; vertex and occiput with scales white and erect forked scales brown; and tergum I with a basolateral patch of silvery scales.

Female genitalia are very similar for the three species but can be separated as follow: *Ae. auridorsum* with sternum VIII without scales, tergum VIII index 0.62–0.63, tergum IX length 0.24–0.26 mm, and cercus width 0.15–0.18 mm; *Ae. pecuniosus* and *Ae. purpureus* have sternum VIII with scales (on apical 0.59–0.66 in *Ae. pecuniosus* and on apical 0.82–0.86 in *Ae. purpureus*), tergum VIII index 0.68–0.76, tergum IX length 0.19–0.22 mm, and cercus width 0.12 mm (*Ae. pecuniosus*) or 0.14 mm (*Ae. purpureus*).

Male genitalia of *Ae. auridorsum* are similar to those of *Ae. pecuniosus* but differ as follow: tergum IX with lobes very small, each with 4 setae; gonocoxite length 0.63–0.66 mm; basal mesal lobe with stem bearing setae, 2,3 on distal 0.3, 2,3 on middle 0.3, and 3–5 on proximal 0.3; paraproct with 4 teeth on apical point; and aedeagus longer and narrower; while *Ae. pecuniosus* has tergum IX with lobes small, each with 6,7 setae; gonocoxite length 0.73 mm; basal mesal lobe with stem bearing setae, 4 on distal 0.3, none on middle 0.3, and 7,8 on proximal 0.3; and aedeagus shorter and wider.

No pupae or larvae of this species were available for study; therefore, the above descriptions are adapted from Marks (1948). From the pupal description and illustration for *Ae. auridorsum* of Marks (p. 26), it appears that this species may differ from *Ae. pecuniosus* by: seta 8-CT single, 10-CT with 2 branches, and 1-II-IV with 2–6 branches; while specimens of *Ae. pecuniosus* possess 8-CT with 3–5 branches, 10-CT with 3–5 branches, and 1-II-IV single or 2-branched. Marks' (p. 24) description and illustration of *Ae. auridorsum* indicate: seta 4-C single, 3-VIII with 3–6 branches, comb with 8–12 scales, pecten with 19–22 spines, and 4-X with 18–22 (one specimen with 12) setae, 3,4 basad of boss; while specimens of *Ae. pecuniosus*

possess 4-C with 3,4 branches, 3-VIII with 7–10 branches, comb with 5,6 scales, pecten with 8–11 spines, and 4-X with 17–19 setae, all attached to boss.

Very small samples of all three species were used to obtain ranges of setae and other structures in all life stages, sexes and genitalia; therefore, it is expected that these ranges may increase and other variability will be found when larger samples are examined. Further study of larger numbers of individually reared adults with associated immature exuviae also may reveal additional reliable specific and subgeneric characters.

Lee et al. (1982) give a complete bibliography for *Ae. auridorsum* (p. 121) and *Ae. purpureus* (includes *Ae. pecuniosus*) (p. 236).

**Distribution.** 25 specimens examined: 13 ♀, 2 ♀G, 8 ♂ and 2 ♂G; AUSTRALIA: *Queensland*, Eidsvold (1 ♀, 2 ♀G, 1 ♂, 1 ♂G, paratypes; 7 ♀, 4 ♂), Brigalow Scrub (Eidsvold) (1 ♀, paratype), Mt. Perry Scrub (Eidsvold) (1 ♂, 1 ♂G), locality assumed to be Eidsvold (4 ♀, 1 ♂), Fairy Bower, Rockhampton (1 ♂). Other distribution from literature. AUSTRALIA: *Queensland*, Moolayember Gorge, Carnarvan Gorge area; Gracemere via Rockhampton; Nambour-Maryborough District (Lee et al. 1982).

**Bionomics.** Lee (1944) reports the larval habitat as tree holes, Marks (1948) records larvae collected from a cavity in the butt of a tree in dry vine scrub, and Marks (1962) found larvae in a cavity of a bottle-tree. Marks (1948, 1955) reports the larvae to be predaceous on other mosquito larvae. Females have been recorded biting humans by Marks (1948, 1962).

### *Aedes (Molpemyia) pecuniosus* Edwards (Figs. 3–8)

*Aedes (Finlaya) pecuniosus* Edwards 1922:94 (♀); Cooling 1924:24 (A\*, ♀, ♂\*, L\*); Edwards 1932:153; Lee 1944:65 (L\*); Reinert 1988:59 (♀\*); Evenhuis and Gon 1989:197; Ward 1992:186.

*Aedes (Finlaya) purpureus* of Taylor 1944:122 (♂\* ?) (in part); Knight 1948:3 (in part); Knight and Marks 1952:566 (in part);

Marks 1955:26 (in part); Stone et al. 1959:169 (in part); Knight and Stone 1977:102 (in part); Lee et al. 1982:236 (in part).

**Female** (Fig. 3). *Head*: Antenna 0.96 length of proboscis; maxillary palpus 0.22–0.30 length of proboscis, scales blackish brown with violet hue; proboscis 1.07–1.11 length of femur I, scales blackish brown with violet hue; vertex and occiput with decumbent scales white and erect forked scales brown, interocular and ocular setae golden except for lateral 2–5 dark brown ocular setae, postgena with scales next to vertex and along posterior margin of eye pale brownish white, remainder pale or dark brown and those on posterior area blackish brown. *Thorax*: Scutum covered with narrow curved dark reddish brown scales except for areas of sbos scales as follow: stripe of 4 scales abreast from anterior promontory area for short distance caudally and then continuing as stripe of 2 scales abreast on acrostichal area to posterior median scutal area where it forms a medium-sized patch and then continues as 2,3 scales abreast stripe on lateral margins of prescutellar area to scutellum, large patch covering scutal fossal area except for bare area at scutal angle, narrow stripe (single or double row of scales) laterad of prescutellar setae, large patch extending from near scutal angle over antealar and supraalar areas; setae: 3 median anterior promontory, acrostichal (few anterior and few posterior), several dorsocentral (anterior and posterior), scutal fossal (7 anterior, 3–6 lateral, 1–3 posterior), and one parascutellar; scutellum with patch of sbos scales on each lobe; antepnotum with sbos scales, several setae; postpronotum covered with sbos scales, 4,5 posterior setae; postspiracular area without scales, 2–6 setae; subspiracular area with elongate patch of sbos scales; proepisternum with patch of sbos scales, 5–7 setae; mesokatepisternum with large upper and small lower patch of sbos scales, 3 upper and 9–11 lower posterior setae; prealar area with sbos scales, 9 setae; mesepimeron with large patch of sbos scales, 8–12 upper setae; metameron with or without few sbos scales. *Legs* (Fig. 4): Femora

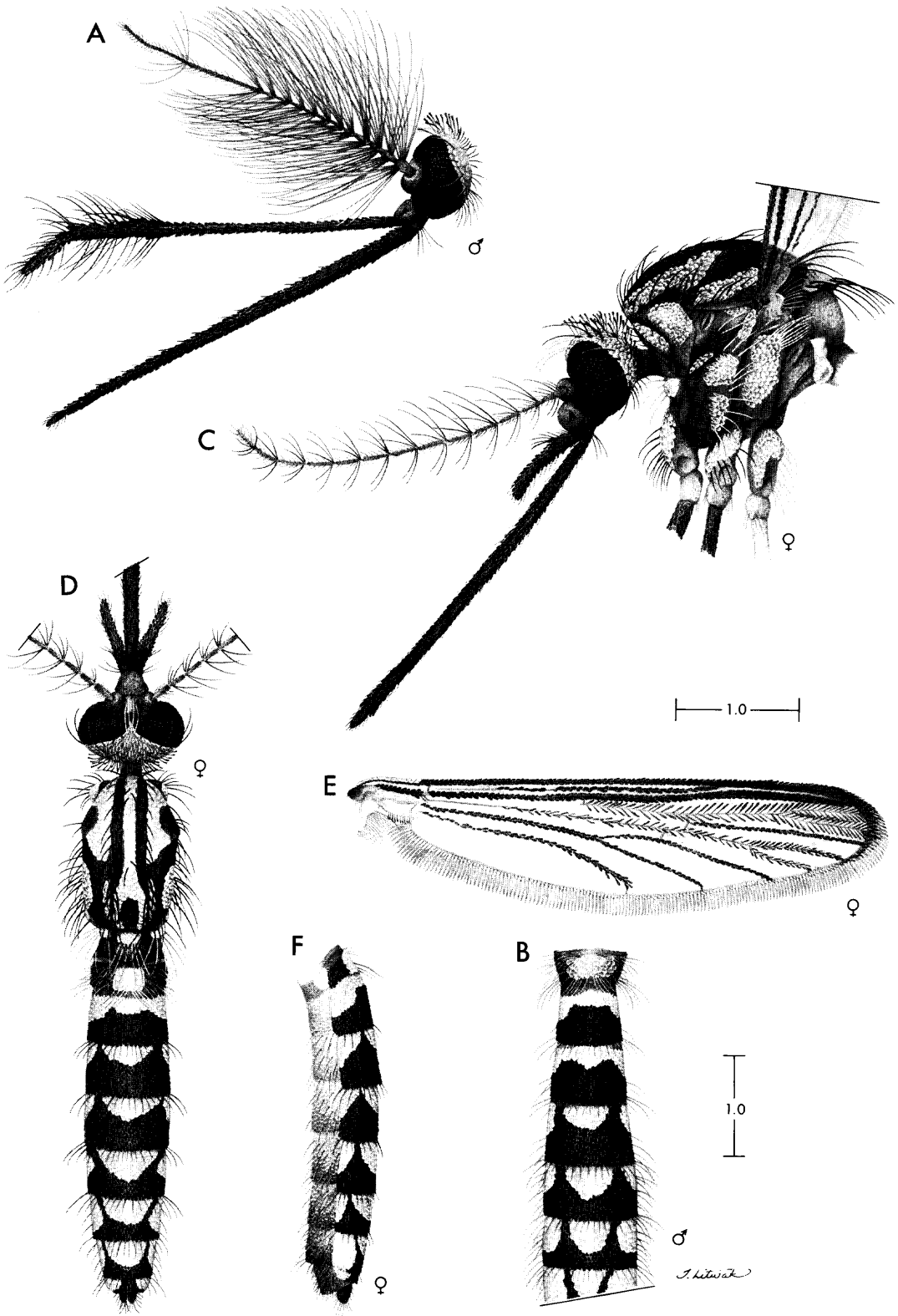


Fig. 3. *Aedes (Mol.) pecuniosus*. A,B, Male [A, head and appendages (lateral); B, abdomen (dorsal)]; C-F, female [C, head and appendages, and thorax (lateral)]; D, head, thorax and abdomen (dorsal); E, wing; F, abdomen (lateral).

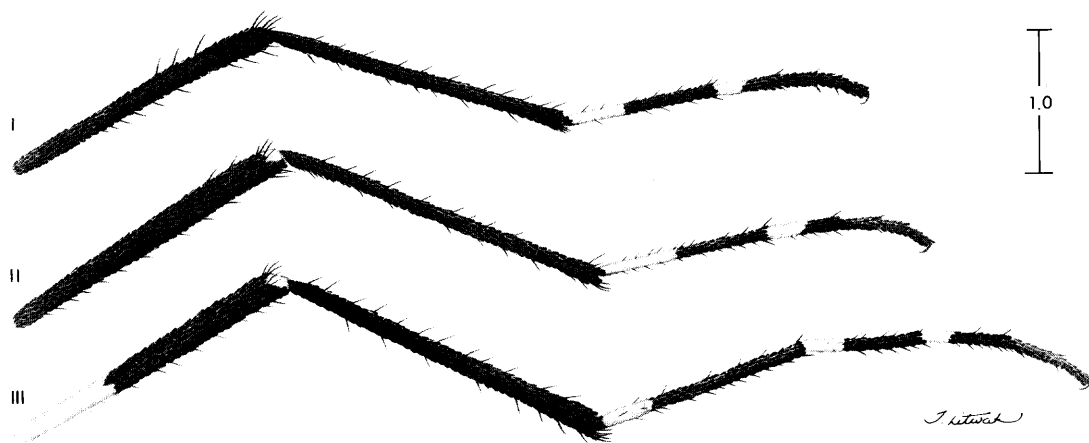


Fig. 4. *Aedes* (Mol.) *pecuniosus*, female legs (anterior).

I-III with scales dark blackish brown with violet hue, I also with indistinct posterodorsal stripe of pale brown scales on basal area, II also with indistinct posteroventral stripe of dusty white scales on basal area, III also with broad band of white scales on basal approximately 0.25–0.30; tarsus III also with tarsomere 4 with or without small basodorsal white-scaled spot. *Wing*: With elongate patch of creamy white scales on anterior margin of costa basad of humeral crossvein. *Abdomen*: Terga with scales blackish brown with violet hue, I also with large dorsal patch and lateral patch of silvery scales, II-VIII also with large basolateral patch of silvery scales, II, III with narrow basodorsal silvery-scaled band connecting to basolateral silvery-scaled spots (band may be incomplete on III), IV-VII with large basodorsal silvery-scaled patch; sterna silvery-scaled, II-VII also with glossy brown scales on caudal margin covering a triangular median area; tergum I with large patch of golden setae on dorsal surface. *Genitalia* (Fig. 5): Tergum VIII with scales on apical 0.64–0.65, scales on distal area somewhat longer, setae on apical 0.38–0.55, VIII-Te index 0.63–0.76, VIII-Te/IX-Te index 2.08, length 0.40–0.47 mm, width 0.59–0.61 mm; sternum VIII heavily pigmented, base slightly concave mesally, scales on apical 0.59–0.66 and covering much of lateral area but not on median line, setae on apical 0.90–0.94, VIII-S index 0.66–0.73, length 0.53–0.59 mm, width 0.73–0.90 mm; tergum IX heavily pig-

mented, 6–8 setae apically on each side of midline, 14 total setae, base nearly straight, IX-Te index 0.6, length 0.19 mm, width 0.32 mm; insula heavily pigmented, 6, 7 setae on each side of midline, 13 total setae; lower vaginal lip heavily pigmented; postgenital lobe with apex flat, basal mesal apodeme absent, 16, 17 setae on each side of midline, 33 total setae, ventral PGL/cercus index 0.61, dorsal PGL index 1.30, ventral PGL index 1.95, ventral length 0.22 mm; cercus with setae on apical 0.76 of dorsal surface, cercus index 2.98, cercus/dorsal PGL index 2.46, length 0.36 mm, width 0.12 mm.

**Male** (Fig. 3). *Head*: Antenna 0.76 length of proboscis; maxillary palpus 0.92 length of proboscis, palpomeres with following approximate proportion of total length, 5 = 0.16, 4 = 0.17, 3 = 0.34, 2 = 0.25, 1 = 0.08, palpomere 3 with few semierect moderately long setae around apical portion, palpomere 4 with numerous long erect setae ventrally and few laterally; proboscis 1.22 length of femur I. *Genitalia* (Fig. 6): Tergum IX with pair of small caudally projected lobes each bearing 6, 7 setae; gonocoxite with Gc length 0.73 mm; gonostylus narrow throughout length but with slight swelling subapically on mesal surface, this area with several short spicules, 1, 2 short subapical setae, Gs length 0.29 mm, Gs/Gc index 0.4, GC length 0.05 mm, GC/Gs index 0.17; basal mesal lobe with stem bearing setae, 4 on distal 0.3, none on middle 0.3, and 7, 8 on proximal 0.3, completely covered with

short spicules, BML/Gc index 0.37, BML length 0.27 mm; paraproct with apical beak-like point with 2 teeth, 6,7 cercal setae; aedeagus moderately long, wide, basal 0.45 with uniform width then lateral areas expanded and rounded, this area followed by bluntly rounded apex, split mesally, Ae length 0.21 mm, paramere length 0.14 mm, Par/Ae index 0.53, basal piece length 0.11 mm, BP/Ae index 0.68; sternum IX with 9 setae.

**Pupa** (Fig. 7). Chaetotaxy as figured and recorded in Table 1. *Cephalothorax*: Setae 1,3-CT usually single (2, 3-CT occasionally double or 2-forked); distance between bases of 11,12-CT approximately 3 times that between 10,11-CT. *Trumpet*: Index 2.55–2.65. *Abdomen*: Many setae with forked branches; transverse ridge caudad of seta 14 on sterna III–VII; 1-II–VII single or 2-forked; 3-II,III, 5-IV–VI moderately long; 9-III–V apparently ventral, 9-II,VI–VIII dorsal. *Paddle*: Index 1.19–1.22.

**Larva** (Fig. 8). Only 2 imperfect larval exuviae were available for study; therefore, the positions of setae on the illustration were determined as best as possible in the absence of whole larvae to distinguish exact locations. Chaetotaxy as figured and recorded in Table 2. *Head*: Heavily pigmented; seta 4-C moderately long; 6-C long but shorter than 5-C; dorsomentum dark, 19–21 stout teeth; 6-Mx single, moderately long, stout. *Antenna*: Heavily pigmented, gently tapering from base to apex; 1-A borne 0.29–0.30 from base. *Thorax*: Seta 1-P long, stout, separated from 2,3-P, latter 2 setae short; 5–7-P, 5–10,12-M, 1,7,9,10-T stout, dark, aciculate, all except 5-P, 6,9-M, 9-T relatively short; 5,6-P and 6,7-M on single dark setal support plate. *Abdomen*: Setae 6,7-I and 6,7-II on common dark setal support plate, 7-I,II only slightly shorter than 6-I,II; 1,13-II–V, 6-I–VI, 7-I,II each long, stout, dark, aciculate, attached to a dark setal support plate; segment VIII with comb of 5,6 scales; saddle large, dark; 4-X consists of 17–19 2-forked (rarely single) setae on rudder-like boss; 4 anal papillae, appear to be approximately equal in length. *Siphon*: Heavily pigmented, index 1.08–1.13; saddle/siphon index 1.08–1.11; pecten on basal 0.23–0.24,

composed of 8–11 spines, basal ones short, remainder long, narrow, with 2–4 small spicules on ventral margin; 1-S borne on basal 0.29–0.30 of siphon; 2,6,7,9-S single; 8-S with 3–6 branches; spiracular apodeme dark.

**Discussion.** See discussion section of *Ae. auridorsum* for a comparison of this species with the other two. For an explanation of Cooling's (1924) invalid manuscript name, *Aedes (Finlaya) priestleyi hamadryadis*, see Reinert (1988).

Taylor's (1944) illustration of the male genitalia of *Ae. purpureus* was based on Cooling's (1924) specimens from Derby and additional specimens from Herberton, and after comparing their male genitalia he stated that they showed no differences. Additionally, W.V. King compared a male from Derby with one from Herberton, and Taylor reported that King "could find no tangible differences in the males." Taylor then synonymized *Ae. pecuniosus* with *Ae. purpureus*. Marks (1955) noted that all the males that she had examined, including Cooling's (1924) specimens from Derby, had a stripe of broad silvery scales on the acrostichal area. This feature would distinguish them as *Ae. pecuniosus*. Because of the above and since Reinert (1988) resurrected *Ae. pecuniosus* as a valid species, I feel that Taylor's illustration represents *Ae. pecuniosus* and not *Ae. purpureus*.

In *Ae. pecuniosus* and *Ae. purpureus*, the broad silvery scales of the thorax are very broad, spatulate and with apices broadly rounded (presenting a rounded appearance). Edwards (1924) pointed out the similarity of the broad silvery-scaled acrostichal stripe of *Ae. pecuniosus* with the African species *Ae. longipalpus* (Grunberg) and *Ae. fulgens* Edwards and that it was "curious also to note that in two other quite distinct genera (*Harpagomyia* and *Topomyia*) a silvery thoracic stripe may be present or absent in closely allied species" (*Harpagomyia* de Meijere is currently a synonym of *Malaya* Leicester). The same is true of *Ae. pecuniosus* and *Ae. purpureus* for the presence and absence of the broad silvery-scaled acrostichal stripe.

**Distribution.** 15 specimens examined: 1 ♀PLG, 1 ♂PLG, 2 ♀ and 5 ♂; AUSTRALIA:

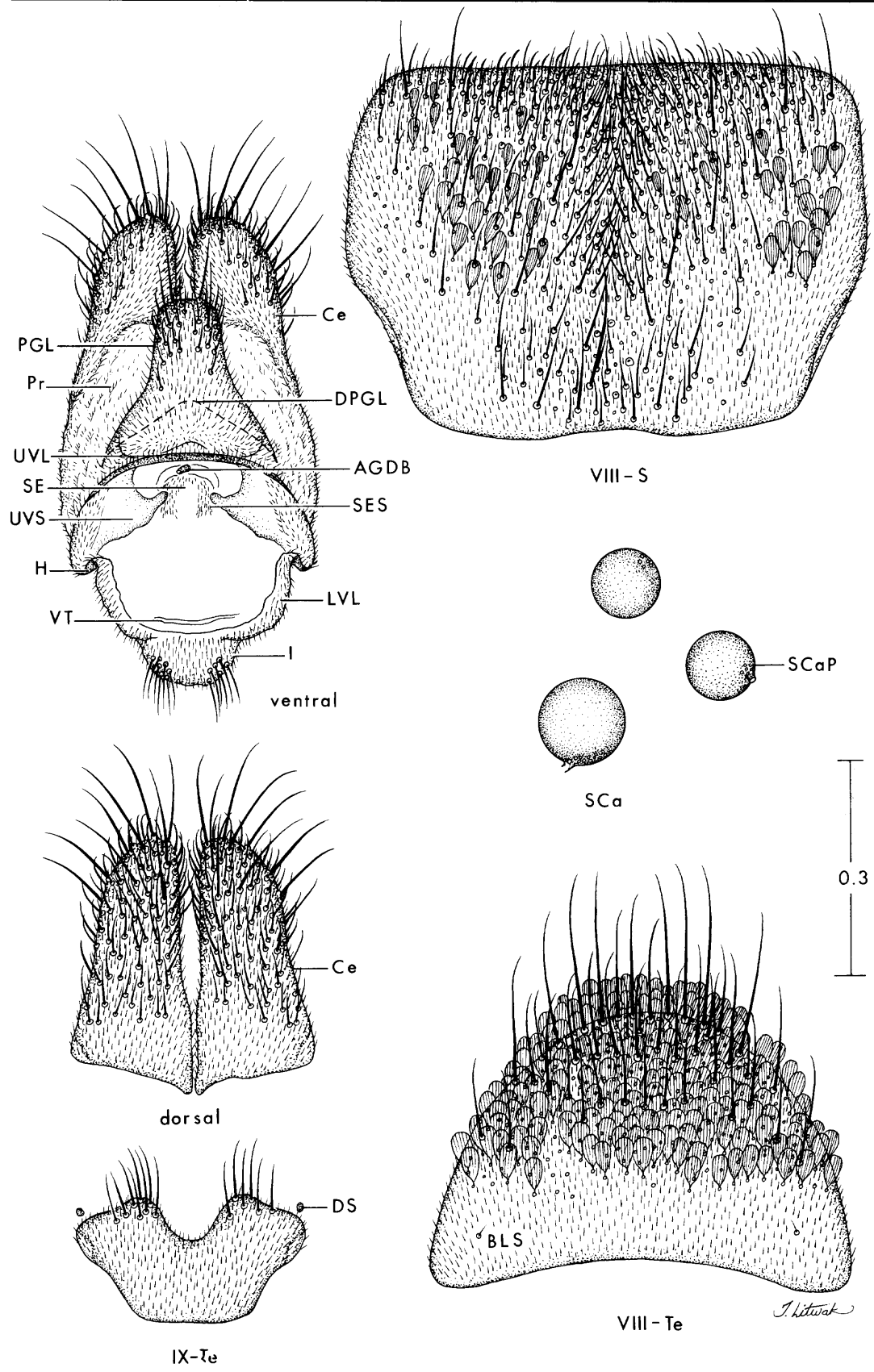


Fig. 5. *Aedes (Mol.) pecuniosus*, female genitalia.



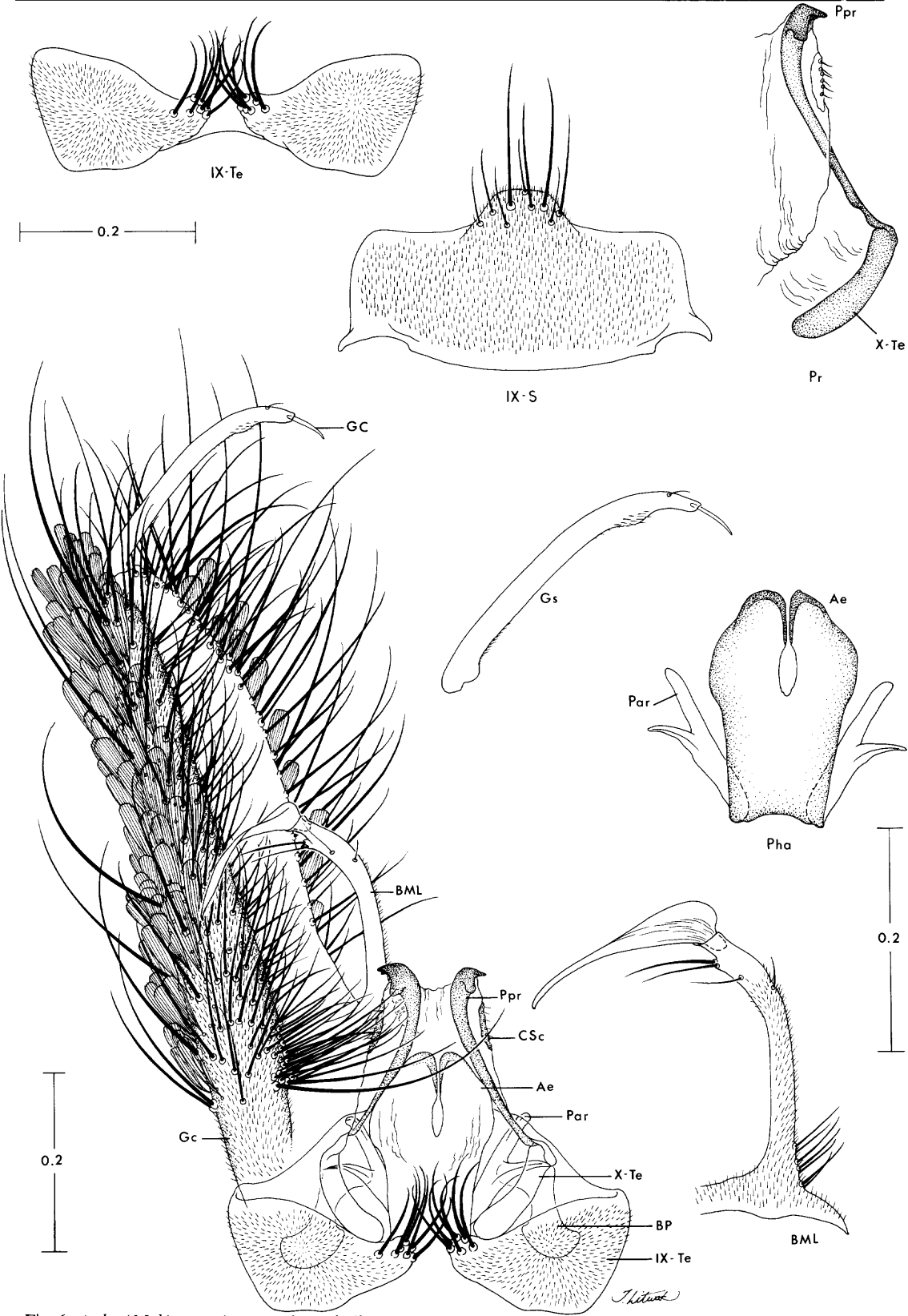


Fig. 6. *Aedes (Mol.) pecuniosus*, male genitalia.

**Table 1.** Branching of the setae on pupae of *Aedes (Molpemyia) pecuniosus* (2 specimens).

Seta no.	Cephalothorax CT	Abdominal segments								Paddle Pa
		I	II	III	IV	V	VI	VII	VIII	
0	—	—	1	1	1	1	1	1	1	—
1	1	9–12	1, 2	1, 2f*	1, 2f	2f	1, 2	1–4f	—	1
2	1, 2	1	1	1	1	1	1	1	—	—
3	1, 2f	1	1	1	3, 4	1	1, 2f	1	—	—
4	1	6f–10f	4, 5	3f–5f	3, 4	4–6	2, 3	1	1	—
5	1–4f	2f–4f	1, 2	1, 2f	1	1	1	2f–5	—	—
6	1, 2f	1	1	1–3	1	1	1	4f–9	—	—
7	2f, 3f	1–3	2f, 3f	3f–6f	3f–6f	8f–12f	1	1	—	—
8	3–5	—	—	3f, 4f	3f, 4f	3f–5	3f–5	4f, 5f	—	—
9	1	1, 2f	1	1	1	1	1	1	1	—
10	3–5	—	—	1, 2f	1, 2f	1	1	1	—	—
11	1, 2f	0–4	—	1	1	1	1	1	—	—
12	2, 3	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—
14	—	—	—	1	1	1	1	1	1	—

\* f = forked.

Queensland, Townsville (1 ♀PLG, 1 ♂PLG); Northern Territory, Port Darwin (1 ♀, holotype of *Ae. pecuniosus*); Western Australia, Derby (5 ♂). Other distribution from literature. AUSTRALIA: Darwin; Mareeba; Vonrook; Wrotham Park; Magnetic Is. (based on description of Marks 1955, i.e., stripe of broad silvery scales on acrostichal area); Herberton (Taylor 1944); Northern Territory, Mission Station, Elcho Is. (Cooling 1924); records of Lee et al. (1982) are not possible for me to assign to either *Ae. pecuniosus* or *Ae. purpureus*.

**Bionomics.** Cooling (1924) stated that the larvae of this species inhabit water in rot-holes in the boles of Cream-of-Tartar or Boab trees around Derby. Cooling found, that in the laboratory, adults of both sexes readily feed on plant juices of banana and date, and that the females were avid biters of humans, producing a fair-sized wheal accompanied by intense itching. He reports the species to be sluggish, not readily taking to flight when disturbed, and occurring in the Derby area during January and February almost immediately after rains. Marks (1955) (citing Hodgkin and Britten 1955, reported as *Ae. purpureus*) states that debris collected from a dry tree hole in an eucalypt at Vanrook Creek, when flooded, produced larvae that were predaceous on other mosquito larvae. Marks (1955) records larvae (reported as *Ae. purpu-*

*reus*) collected at Wrotham Park from a large tree hole in a mango tree in which the water was very foul from rotten leaves and mangoes.

*Aedes (Molpemyia) purpureus*  
(Theobald)  
(Fig. 9)

*Molpemyia purpurea* Theobald 1910:479 (♀); of Taylor 1919:838.  
*Ochlerotatus purpureus* of Edwards 1912a:523.  
*Ochlerotatus* (?) *purpurea* of Brunetti 1914:65; Senior-White 1923:74.  
*Calomyia priestleyi* Taylor 1914:684 (♀).  
*Aedes (Finlaya) priestleyi* of Edwards 1932:153.  
*Aedes (Finlaya) purpureus* of Edwards 1932:153; Taylor 1944:122 (in part); Knight 1948:2 (in part); Knight and Marks 1952:565 (in part); Marks 1955:26 (in part); Stone et al. 1959:169 (in part); Knight and Stone 1977:102 (in part); Lee et al. 1982:236 (in part); Reinert 1988:56 (♀\*); Evenhuis and Gon 1989:197.

**Female.** The female description is based on the holotypes of *Ae. purpureus* and *Ae. priestleyi*. *Head:* Antenna 0.93 length of proboscis; maxillary palpus 0.25–0.29 length of proboscis, scales blackish brown with violet hue; proboscis 1.05–1.11 length of femur I, scales

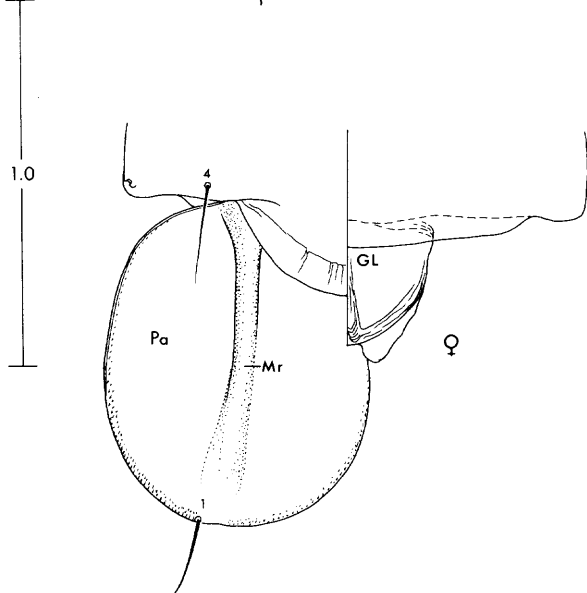
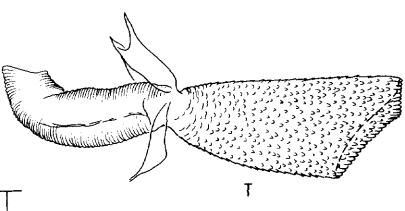
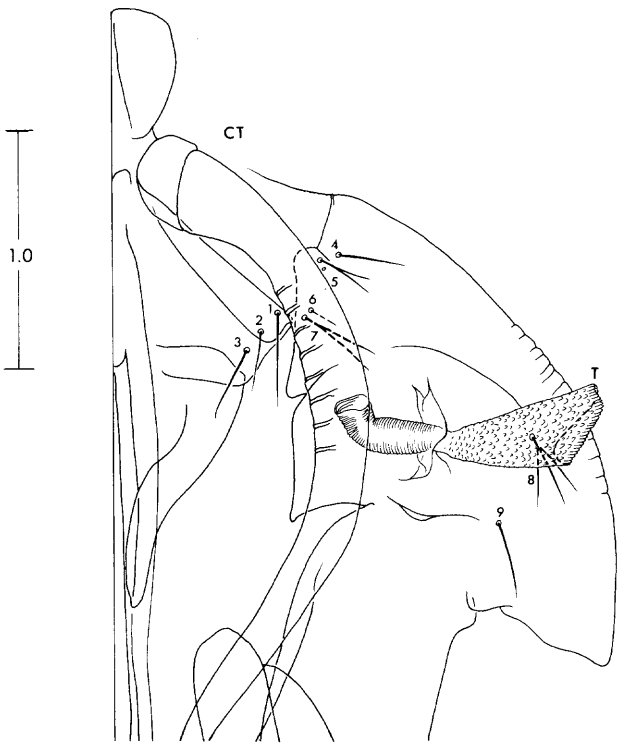
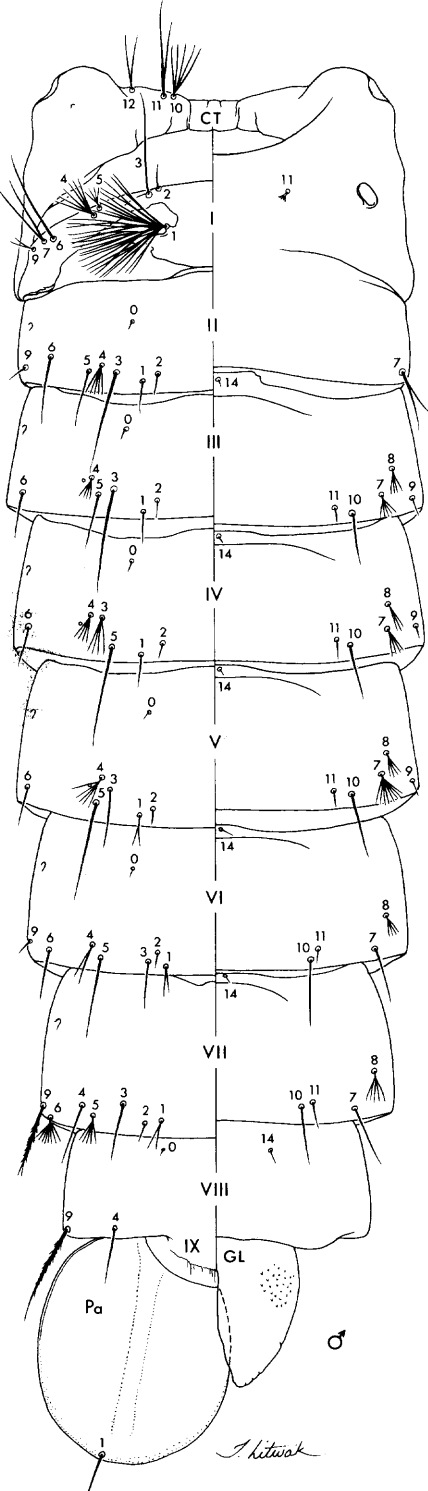


Fig. 7. *Aedes (Mol.) pecuniosus*, pupa.

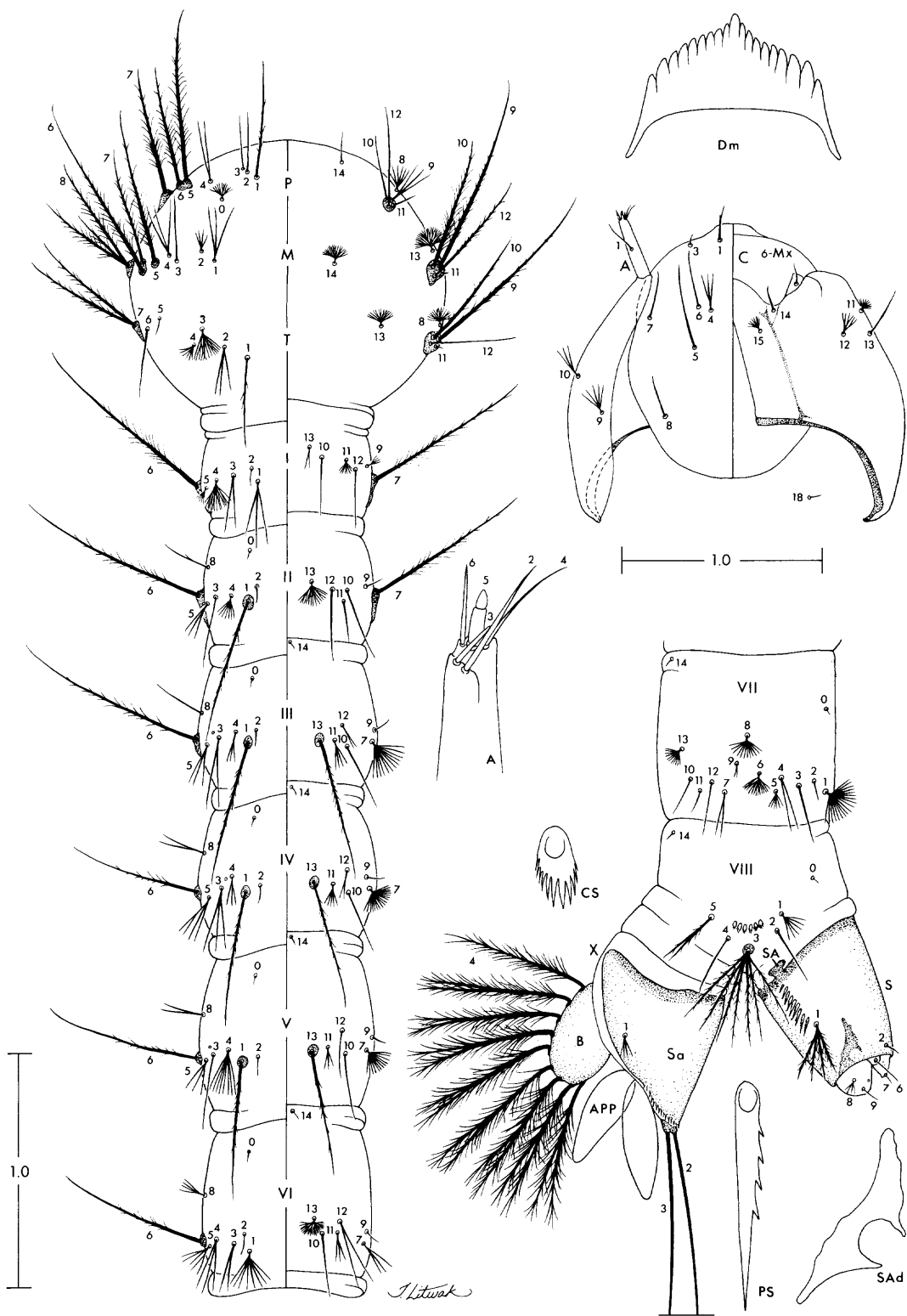


Fig. 8. *Aedes (Mol.) pecuniosus*, larva.

**Table 2.** Branching of the setae on larvae of *Aedes (Molpemyia) pecuniosus* (2 specimens).

Seta no.	Head C	Thorax				Abdominal Segments							
		P	M	T	I	II	III	IV	V	VI	VII	VIII	X
0	?	11-15	—	—	—	1	1	1	1	1	1	1	—
1	1	1	1-3	1	2-7	1	1	1	1	8-14	14-17	6-8	4-7
2	—	1	2, 3	2-5	1	1	1	1	1	1	1	1	1
3	1	1	1	10-13	2, 3	1	1, 2	2-4	1	2-4	1, 2	7-10	1
4	3, 4	2-4	2-4	5	15-24	7-11	2, 3	2-4	8, 9	2-4	1, 2	1	—
5	1	1	1	1-3	4-7	2-5	3-5	3-7	3, 4	4-6	6, 7	1-3	—
6	1	1	1	1	1, 2f*	1, 2f	1	1	1	1	24-29	—	—
7	1	1, 2	1	2	1	1, 2f	12-16	14-17	12-24	3-5	2, 3	—	—
8	1	4-6	2, 3	11-22	—	1	1-3	1, 2f	1, 2f	2-4	12-17	—	—
9	5	3, 4	1	1	2-6	1, 2	1	1	1, 2	1	2, 3	—	—
10	5-7	1	1	1	1	1	1	1	1	1	1	—	—
11	6-10	1	1	1, 2	7, 8	1	3, 4	4, 5	3, 4	1-3	1	—	—
12	3-6	1	1	1, 2	1	1, 2	2	1-3	1	1, 2	1	—	—
13	1	—	25-36	13-19	1, 2	11-17	1	1	1	27-32	14-20	—	—
14	1	1	16-22	—	—	1	1	1	1	1	1	1, 2	—
15	5-10	—	—	—	—	—	—	—	—	—	—	—	—
18	1, 2	—	—	—	—	—	—	—	—	—	—	—	—

\* f = forked.

blackish brown with violet hue; vertex and occiput with decumbent scales white and erect forked scales brown, interocular and ocular setae dark reddish brown, postgena with scales next to vertex and along posterior margin of eye pale brownish white, remainder brown. *Thorax*: Scutum covered with narrow curved dark reddish brown scales (including area between acrostichal setae) except for the following: sbos scales on scutal fossal area, prescutellar area with sbos scales on anterior and lateral margins, narrow stripe of narrow curved white scales on dorsocentral area, few narrow curved white scales on posterior dorsocentral and posterior medial scutal areas, patch of sbos scales on supraalar area; setae: 2-4 median anterior promontory, numerous acrostichal and dorsocentral (anterior and posterior), scutal fossal (2-6 anterior, 2-4 lateral, 2-4 median and 1,2 posterior), and one parascutellar; scutellum with patch of sbos scales on each lobe, lateral lobes also with few narrow curved white and brown scales on caudolateral areas; antepnotum with sbos scales, several setae; postpronotum covered with sbos scales, 7-9 posterior setae; postspiracular area without scales, 6-10 setae; subspiracular area bare; proepisternum with sbos scales, 7-11 setae; mesokatepisternum with large upper and small lower patch of sbos

scales, 3-5 upper and 9-16 lower posterior setae; prealar area with sbos scales, 11-13 setae; mesepimeron with large patch of sbos scales, 17-19 upper setae; metameron bare. *Legs*: Femora I-III with scales blackish brown with violet hue, I,II also with patch of creamy brown scales on basoposterior area, III also with anterior and posterior surfaces with basal approximately 0.5 white-scaled; tarsus II also with tarsomere 3 with small basodorsal spot of snowy white scales, III with tarsomeres 3,4 missing from both specimens. *Wing*: With 2 white scales on anterior surface of costa near base of right wing (in holotype of *Ae. purpureus*). *Abdomen*: Terga with scales blackish brown with violet hue, I also with large dorsal patch and lateral patch of silvery scales, II-VII also with large basolateral patch of silvery scales, II also with basodorsal silvery-scaled band connected with laterobasal patches, III-VI also with basodorsal silvery-scaled band not connecting to basolateral patches, VII,VIII also with large basomesal area of silvery scales; tergum I with large patch of golden setae on lateral and posterior areas; sterna with broad silvery scales on basolateral areas and broad brown scales on caudomedian areas. *Genitalia* (Fig. 9): Tergum VIII heavily pigmented, with scales on apical 0.64-0.70, setae on apical 0.48-0.58, VIII-Te index

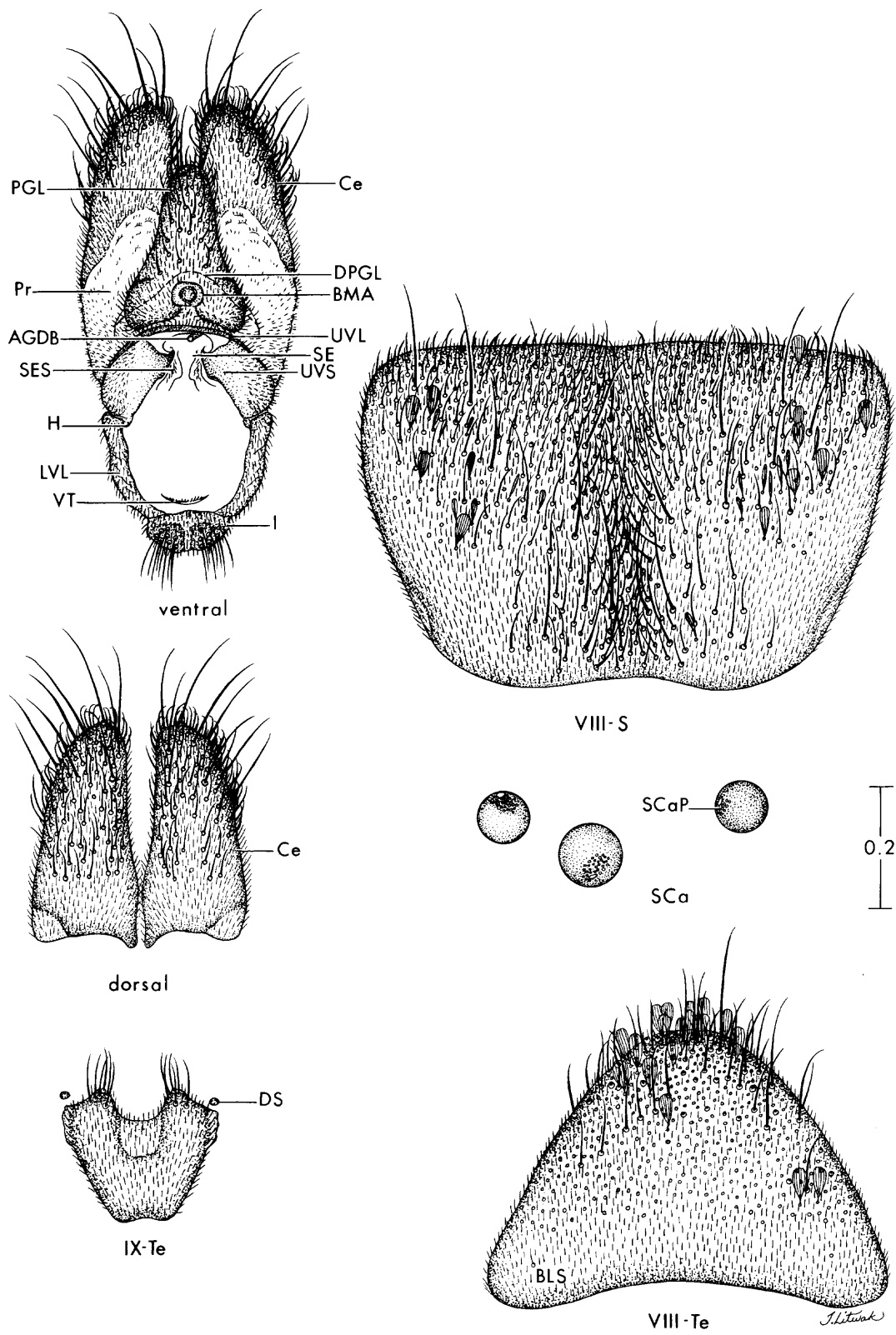


Fig. 9. *Aedes (Mol.) purpureus*, female genitalia.

0.7, VIII-Te/IX-Te index 2.18–2.28, length 0.44–0.47 mm, width 0.63–0.67 mm; sternum VIII heavily pigmented, base slightly concave mesally, several broad and few narrow scales on apicolateral 0.82–0.86, setae on apical 0.90–0.93, VIII-S index 0.64–0.65, length 0.56–0.57 mm, width 0.88 mm; tergum IX heavily pigmented, median apical area lightly pigmented, 5,6 setae apically on each side of midline, 11 total setae, base slightly concave, lateral margins slightly bowed, IX-Te index 0.65–0.89, length 0.19–0.22 mm, width 0.24–0.29 mm; insula moderately pigmented, 7–9 setae on each side of midline, 15–18 total setae; lower vaginal lip moderately pigmented; postgenital lobe with apex sharply rounded, basal mesal apodeme pigmented and circular, 19–24 setae on each side of midline, 40–45 total setae, ventral PGL/cercus index 0.69–0.71, dorsal PGL index 1.66–1.71, ventral PGL index 2.56–2.57, ventral length 0.25–0.27 mm; cercus with setae on apical 0.69–0.76 of dorsal surface, cercus index 2.63–2.72, cercus/dorsal PGL index 2.10–2.25, length 0.37–0.38 mm, width 0.14 mm.

**Male.** Not known with certainty.

**Pupa and larva.** Unknown.

**Discussion.** See discussion section of *Ae. auridorsum* for a comparison of this species with the others.

**Distribution.** 4 specimens examined: 2 ♀ and 2 ♀G; AUSTRALIA: *Queensland*, Stannary Hills (1 ♀, 1 ♀G, holotype of *Ae. purpureus*), Townsville (1 ♀, 1 ♀G, holotype of *Ae. priestleyi*). Other distribution from literature. AUSTRALIA: Atherton; Trinity Bay (based on description of Marks 1955, i.e., narrow curved white scales on acrostichal area); records of Lee et al. (1982) are not possible for me to assign to either *Ae. purpureus* or *Ae. pecuniosus*.

**Bionomics.** Marks (1955) and Lee et al. (1982) record the immature habitat as tree holes and the larvae are predaceous. The exact bionomics of this species could not be distinguished as these reports included records of *Ae. pecuniosus* (as a synonym) along with those of *Ae. purpureus*. Theobald (1910), in the original description of *Ae. purpureus*

stated the holotype female was collected resting on a grass stalk in April at Stannary Hills. Taylor (1914) reported the holotype female of *Ae. priestleyi* was collected during March at Townsville.

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